A machine for air filtration that is self cleaning and process for filtering air with same as well as multiple steps for entrapment and neutralization of bacteria germs and particulate for detection and recognition of toxic and noxious gases and radiation detection

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Title of the Invention

A machine for air filtration that is self cleaning and process for filtering air with same as well as multiple steps for entrapment and neutralization of bacteria germs and particulate for detection and recognition of toxic and noxious gases and radiation detection

Cross Reference to Related Applications

Not Applicable

Statement Regarding Federally Sponsored Research or Development

Not Applicable

Description of Attached Appendix

Not Applicable

Background of the Invention

This invention relates generally to the field of treating air and more specifically to a machine for air filtration that is self cleaning and process for filtering air with same as well as multiple steps for entrapment and neutralization of bacteria germs and particulate for detection and recognition of toxic and noxious gases and radiation detection with automatic safety shut down that will trigger an audible and visual alarm.

Prior to 911 I had developed a system of filtering air for use in the heating ventilation air conditioning discipline using knowledge acquired in the field of practical design and application. It became apparent that there is no system or process of systems available

in field application or patents granted, for the self contained removal and disposal of health threatening diseases such as anthrax and all other equivalents of airborne diseases. Subsequent to the horrific 911 incident it became immediately clear that steps to design a system and a process using that system to either front end an existing heating ventilation air conditioning system or become a total stand alone system or part of a new heating ventilation air conditioning system installation. I believe this process is the solution to the removal of all life threatening forms of airborne diseases known at the time of this writing and application.

Prior Technology

air filters for air handling systems available in a multitude of variations hepa, allergen, micro, with activated charcoal, with electrostatic charge, as prefilters, with carbon, containing zeolite and potassium permanganate, used to remove varying sizes of particulate from the air being drawn through the filter such as pollen, dust, lint, pet dander, mold, bacteria, smoke and smog particles, some even claim to catch particles that can carry viruses

activated charcoal or carbon in filter or drum absorbs gaseous pollutants especially volatile organic compounds, odors and large particulate

ultraviolet lights used in different places in air handling system to break down almost all organic contaminants such as bacteria, micro viral organisms, mold, infectous diseases and has the added benefit a side effect which is negative ions that freshen the air and can make people feel uplifted and lively

inline dryer used to control humidity levels

gas detection and recognition system fairly new technology is currently a stand alone

system

radiation detection used in nuclear power facilities

recirculation pump circulates liquid through a given system

ultrasonic transducer used to agitate liquid with the use of sound waves at a frequency of 20 kilohertz or higher to induce particulate release from surfaces in liquid

a subsonic transducer agitates with sound using low frequency for particulate suspension

audible and visual alarm widely available

air diffuser used to prevent laminar air flow avaliable in innumerable configurations

automatic safety shut off will shut down any given system in case of a harmful situation

four and five step systems that combine usage of the following ultraviolet, hepa, carbon drum, carbon post filter, filter with carbon, prefilter, ionizer, collector plates, activated charcoal, negative ion, and ozonation each multiple step system was designed to satisfy the multiple causes of pollution in specific work and home environments to offer better air quality

There seem to be several areas were the currently available air filter systems could use improvement one of these areas is the multiple step units are almost exclusively stand alone and do not have an option to be installed into current or new air handling systems as well as the exorbitant cost of replacement filters of which many said units have more than one some as many as three the added inconvenience of different schedules for filter changes varying from one month to four years time span given that some systems have two or three filters all of which need to be cleaned or changed on different schedules which now brings into question if the filters are not changed or cleaned

precisely on schedule are they still effective all systems lack ease of maintenance as well as many said systems are targeted at very specific problems such as allergies, odors, gases or particulate and function very well in that arena but are completely lacking in all other areas of the said systems some do and most do not offer the option for humidity control and automatic safety shut down none of the systems offer both plus toxic and noxious gas detection and recognition plus radiation detection and a audible and visual alarm we are offering all of this in our process as well as a system that will self clean and dispose of any particulate, bacteria or germs without the need to be handled

Brief Summary of the Invention

The primary function of the invention is to provide a system with optimal efficiency and minimal maintenance.

Another object of the invention is to provide a system that will entrap any and all particulate that is in fresh or recirculate air.

Another object of the invention is to provide a system that will extract bacteria germs and particulate and neutralize and dispose of such with out the need to be handled.

A further object of the invention is to provide a method that is a composite of individual systems.

Yet another object of the invention is to provide a self contained system for removal and disposal of health threatening airborne diseases.

Still yet another object of the invention is to provide a method of strategic placement of various options to optimize bacterial germ and particulate extraction.

Another object of the invention is to provide a method that will neutralize airborne particulate bacteria and germs.

Another object of the invention is to provide a method that detects toxic noxious gases and radiation with automatic safety shut down of the entire air handling system.

A further object of the invention is to provide a method that when safety shut down occurs a safety mechanism places a charcoal filter into place to absorb and help prevent further circulation of any harmful gases .

Yet another object of the invention is to provide a audible and visual alarm when shut down occurs.

Still yet another object of the invention is to provide a process that will identify gases including nerve agents.

Another object of the invention is to provide a process with optional humidity control.

Other objects and advantages of the present invention will become apparent from the following descriptions, taken in connection with the accompanying drawings, wherein, by way of illustration and example, an embodiment of the present invention is disclosed.

In accordance with a preferred embodiment of the invention, there is disclosed a machine for air filtration that is self cleaning comprising: a filter comprising a motor driven belt or disk or counter rotating disks that are perforated, a spray bar, a

recirculation pump and supply line, a wet tank, a ultrasonic transducer , ultraviolet submersible bulbs , a water fill port, a liquid level sensor, a liquid and sediment drain port, and a power source preferred embodiment may also include a subsonic transducer on the wet tank and or a chemical injection port on the wet tank preferred embodiment may also include a treatment on the surface of the belt, disk or disks.

In accordance with a preferred embodiment of the invention, there is disclosed a process for air filtration that is self cleaning multiple step comprising the steps of: a filter comprising a motor driven belt or disk or counter rotating disks that are perforated, a spray bar, a recirculation pump and supply line, a wet tank, a ultrasonic transducer, ultraviolet submersible bulbs , a water fill port, a liquid level sensor, a liquid and sediment drain port, and a power source as well as a air diffuser, a toxic and noxious gas detection and recognition with radiation detection and automatic safety shut off which would trigger the placement of a charcoal filter to absorb gases that have passed the gas detection system with a visual as well as audible alarm in case of shut down all followed by a ultraviolet saturation chamber prefered embodiment may also include a inline dryer assembly at the end of the process preferred embodiment of method may also include a secondary wet filter, a secondary air diffuser, and a secondary ultraviolet saturation chamber for larger air handling systems.

Brief Description of the Drawings

The drawings constitute a part of this specification and include exemplary embodiments to the invention, which may be embodied in various forms. It is to be understood that in some instances various aspects of the invention may be shown exaggerated or enlarged to facilitate an understanding of the invention.

Figure 10 is a cross sectional view of the multiple counter rotating wet bacteria, germ and particulate extraction disk air filtering invention.

Figure 11 is a cross sectional view of the belted wet bacteria, germ and particulate extraction air filtering invention.

Figure 12 is a cross sectional view of the single wet bacteria, germ and particulate extraction disk air filtering invention.

Figure 13 is a flow chart of the operations that comprise the method of bacteria, particulate and germ extraction and neutralization as well as toxic and noxious gas detection and recognition and radiation detection with a automatic safety shut off and audible as well as visual alarm for all heating ventilation air conditioning as well as air circulation systems .

Detailed Description of the Preferred Embodiments

Detailed descriptions of the preferred embodiment are provided herein. It is to be understood, however, that the present invention may be embodied in various forms. Therefore, specific details disclosed herein are not to be interpreted as limiting, but rather as a basis for the claims and as a representative basis for teaching one skilled in the art to employ the present invention in virtually any appropriately detailed system, structure or manner.

Upon inspection of Figure 10 it will be seen that although this machine is an air filter that is where all similarities end. Attention is drawn to the fact that this is a wet filter that consists of counter rotating disks that are driven by a motor, powered by an outside source or a air driven generator and therefore are not stationary the said filter will also contain perforation. To enable long term use without the possibility of said filter becoming clogged there are spray bars that are provided with liquid from the wet tank by the recirculation pump, the direct results are first it wets the filter to aid in better particulate retention and second due to the continual spray the wet tank can function in a most efficient manner particulate does not get a chance to dry on the filter the wet tank can easily wash off particulate on the filter. The wet tank will include ultraviolet submersible bulbs which will neutralize anything that may be harmful in the wet tank and a ultrasonic transducer aids release of particulate from filter also included in the wet tank will be a liquid and sediment drain port a liquid level sensor that will insure optimum levels of liquid at all times with the aid of the water fill port which can add additional

liquids using condensate from the evaporator or potable make up water. The wet tank may also include as an option a subsonic transducer to keep particulate in suspension and or a chemical injection port. The function of the wet tank is to wash the filter keeping it clean and functioning at optimum efficience. A further option would be the surface of the filter may be treated.

Turning now to Figure 10 there is shown two counter rotating motor driven perforated filtering disks 22 located on the interior of the air plenum 23 multiple spray bars 24 for each disk 22 a wet tank 25 can be filled using condensate from the evaporator or potable make up water or both through the water fill port 30 wet tank 25 provides wet spray to the spray bars 24 using recirculation pump 26 and supply line 32 wet tank 25 will have a ultrasonic transducer 27 and liquid and sediment drain port 28 in the wet tank 25 ultraviolet submersible bulbs 29 wet tank 25 will also have a liquid level sensor 31 optionally wet tank 25 may also include a subsonic transducer 40 and or a chemical injection port 41 arrows 20 show direction of air flow through disks 22 and air plenum 23.

In like manner Figure 11 is a machine for filtering air, again that is where the similarities to known air filters end. It is to be noted that Figure 11 is a perforated wet filter belt 34 on rollers 36 that is driven by a motor to rotate in the direction of arrow 42 the surface of the filter will be sprayed with liquid from the spray bars 24 which will be supplied from the wet tank 25 with the recirculation pump 26 through the supply line 32 the wet tank 25 will wash the filter 34 and will include a liquid fill port 30 that can be used with the liquid level sensor 31 to keep the wet tank 25 at optimum level using condensate from the evaporator and or potable make up water the wet tank 25 will have a ultrasonic

transducer 27 to keep particulate in suspension and ultraviolet submersible bulbs 29 to neutralize anything that may be harmful in the wet tank 25 there will be a liquid and sediment drain port 28 on the wet tank 25 options are subsonic transducer 40 chemical injection port 41 and surface of the filter can be treated any or all options may be implemented arrow 20 shows direction of air flow thru filter 34 and air plenum 23.

Similarly Figure 12 is a machine for filtering air although this is different in every aspect compared to avaliable air filters. Attention is drawn to the fact that Figure 12 is a single perforated filter disk 38 that is driven by a motor, the surface of the filter will be sprayed with liquid from the spray bars 24 that will be supplied from the wet tank 25 by the recirculation pump 26 thru the supply line 32 the wet tank 25 will wash the filter 38 and will include a ultrasonic transducer 27 a liquid and sediment drain port 28 ultraviolet submersible bulbs 29 to neutralize anything in the wet tank 25 also included will be a liquid level sensor 31 that will keep the wet tank 25 at optimum levels using condensate from the evaporator and or potable make up water thru the liquid fill port 30 options that may be added are surface of the filter may be treated the wet tank 25 may also include a subsonic transducer 40 and or a chemical injection port 41 any or all options may be applied, arrows 20 show direction of air flow thru filter 38 and air plenum 23.

Thus it is seen that while the filter configuration may differ in Figures 10, 11 and 12 this is a machine that filters air using a wet filter that is self cleaning.

Having observed the details of the air filter attention may now be given to the process as shown in Figure 13 which is a flow chart comprising a complete and thorough self

cleaning multiple step process for entrapment and neutralization of bacteria, germs and particulate, detection and recognition of toxic and noxious gases and radiation detection with automatic safety shut down, the process is as follows recirculated or fresh air intake Figure 13-A through the wet filter as claimed in Figures 10, 11 and 12 one of which will be used, and passes through the air diffuser Figure 13-B which prevents laminar air flow air will then flow through toxic and noxious gas detection and recognition and radiation detection system which will include a automatic safety shut off in case of detection which would trigger a charcoal filter to be placed as to enable containment until situation can be fully dealt with, this system would allow prompt recognition of element that caused shut down as well as triggering an audible and visual alarm Figure 13-C, this would be followed by a ultraviolet saturation chamber Figure 13-D to neutralize any airborne contaminants that may be in the air. For large air handling systems a secondary wet filter as claimed in Figures 10, 11 and 12 one of which will be used followed by a secondary air diffuser Figure 13-E and a secondary ultraviolet saturation chamber Figure 13-F to ensure complete and thorough air treatment and optionally a process for making same further comprising of an inline dryer assembly Figure 13-G for controlling excessive humidity levels this process offers the added benefit of placement of various options for the process may be structured as need calls to allow for all feasible configurations.

While the invention has been described in connection with a preferred embodiment, it is not intended to limit the scope of the invention to the particular form set forth, but on the contrary, it is intended to cover such alternatives, modifications, and equivalents as may be included within the spirit and scope of the invention as defined by the appended claims.

Drawing Reference Numerals

Figure 10 wet filter with counter rotating disks
Figure 11 wet filter with belt
Figure 12 wet filter with single disk

20 direction of air flow
22 filtering counter rotating disks
23 walls of air plenum
24 spray bars
25 wet tank
26 recirculation pump
27 ultrasonic transducer
28 liquid and sediment drain port
29 ultraviolet submersible bulbs
30 water fill port
31 liquid level sensor
32 spray bar supply line
33
34 filter belt
35
36 roller for belt
37
38 filter disk
39
40 subsonic transducer
41 chemical injection port
42 direction of filter rotation

Figure 13 flow chart of air treatment process

Figure 13-A recirculated or fresh air
Figure 10 or Figure 11 or Figure 12 wet filter
Figure 13-B air diffuser
Figure 13-C toxic and noxious gas radiation detection and safety shut off
Figure 13-D ultraviolet saturation chamber
Figure 10 or Figure 11 or Figure 12 wet filter
Figure 13-E secondary air diffuser
Figure 13-F secondary ultraviolet saturation chamber
Figure 13-G optional inline dryer